

AD ASTRA...



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AMATEUR RADIO OPERATOR USERS' GROUP

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THE ATARI MICROCOMPUTER NET USERS' GROUP
NET COORDINATOR,

Jack McKirgan II, WD8BNG

4749 S.R. 207 N.E.

Washington C.H., Ohio 43160


(614) 869-3597

Ad Astra...

Volume 1, Number 4

The ATARI Microcomputer Net is a non-Profit organization of amateur radio operators and short-wave listeners who have a common interest- exchanging information on applications, programming and operation of the ATARI Microcomputer System. With these goals in mind, all amateur radio operators and SWLs are invited to join in the Net operations.

In order to receive this newsletter on a regular basis, members are asked to help offset the cost of printing and mailing by sending an annual donation of \$10.00 to the above address. Those who have sent in a donation will find an expiration code on the mailing label. If you have no code on your label, then you have received a copy funded out of the editor's pocket! A free copy of this newsletter will be sent to all new net members and anyone making an inquiry about net operations.

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Here it is the beginning of the holiday season! Oh what glorious times are ahead! There will be new systems introduced and new peripherals for all of us to drool over! Let us not forget that there are certain priorities that we should maintain in our lives! (In other words, save some of your Holiday pay or Christmas Club or Chanukah present money for the family!) Well... maybe a small amount for a memory upgrade or a new disk drive?

You will start seeing a few new fonts starting with this issue of "Ad Astra...". I got my present a little early in the form of an NEC 8023A-C printer! The Radio Shack Lineprinter VII was a good little machine, but this one has four different fonts, each with two sizes, and the crispness of the print is better than the MX-80, which was my second choice. Right now I am using the condensed font which allows me to put 70 columns on our standard format as opposed to the 46 columns in the standard font. I hope that everyone will be able to read this font! You will be seeing several different types in this issue, some done with the LP VII, some with this printer, and others produced with the printers of other members (camera-ready submissions). If you see a particular style that you like, let me know on the net, or drop a card telling me the page that you like the best! I'll try to print the journal in the favorite type of the majority!

The net continues to grow! Our membership has reached the 200 mark and we are only seven months old! Along with this increased membership comes additional correspondence. So far, I have been able to keep up, but at times it gets a little oppressive. Don't get me wrong! I like hearing from you and I want to help with every question that arises. It just means that I have to devote a little more time than I originally had planned! When membership reaches the 10,000 plateau, I may have to hire a secretary!

OOPS! DEPARTMENT

The schematic and accompanying article concerning the CW/RTTY/ASCII interface that was published in issue # 3 of "Ad Astra..." was a BIG HIT! Many of our members have gone to the trouble of producing this great unit! Those of you who have completed this unit as of this date have reported beautiful results- even better than the Kantronics "The Interface" unit. (See report from Dave, KD8Z, elsewhere in this issue.) There was one teeny little problem! The schematic was incomplete in a couple of locations and there was one MAJOR bug... pins 1 and 4 on the EXAR 2211 IC in the receive section were reversed. Fortunately, one of the members caught the error and called me as soon as he received that issue. I was able to contact the author of the article and confirm the

misabeled and unlabeled areas on the schematic. I received an updated version from the author and I have sent corrected versions to all who have requested them. All members who joined since that time received issues with corrections made to them. In any case, I am reprinting the correct version of the schematic in the center of this issue. I regret the inconvenience to all concerned.

Keep those articles coming in! I plan to have the January-February issue to all of you by Christmas, if we get enough information to pass along. Write down that great program, hint, tip or hardware project! We would all like to know more about it! Until then,

73,

Jack

MEMBER SERVICES

DISKETTES: Single-sided (but work on both sides on the Atari 810 disk drive by cutting out a write-enable notch on the opposite side.). These diskettes are unmarked MEMOREX diskettes, PRIME, not seconds. They are shipped without labels or paper sleeves.

ONLY \$2.00 each--- No postage if you order 5 or more! Fifty cents of each diskette sale is put into the fund to improve "Ad Astra...". Add \$1.00 postage if you order less than 5 diskettes.

DISKETTE SLEEVES: I have a supply of plain diskette sleeves which may be purchased with the above diskettes or separately for only 10¢ each. No postage required if you order with diskettes. If ordered alone, please send a 5 x 7" SASE with enough postage to cover the weight of the sleeves.

TRANSIENT VOLTAGE PROTECTORS: After distributing all that we had of this popular item, we have been able to get a few more for members who want to give their ham and computer equipment some great protection! These items cost \$7.25 locally, but one of our members is able to obtain them for us at only \$5.00 each. Sorry, the plug-in version is no longer available. You can have the same protection as the \$29-\$35 commercial units that are advertized in the ham and computer magazines. Just wire across your 110 Volt leads in the power supply section of the rigs or even in the wall receptical that supplies the rigs. EXCELLENT protection!

These products are only available to registered net members from:

THE ATARI MICROCOMPUTER NETWORK

Jack McKirgan II, WD8BG

4749 S.R. 287 N.E.

Washington C.H., Ohio 43168

THE OPERATING ROOM

I would like to share my experience with those of you who are contemplating on getting into the ATARI 800. I had two reasons for getting into mine, one being that the space bar was becoming intermittent and two, that the select switch was slow in returning to its normal position.

First, remove the ROM cover but leave the modules in place. There is no need to remove them. Be sure to turn the locking tabs back to their closed position. These tabs will get hung-up when you try to remove the ROM case if left in the open position. Turn the unit over and remove the five Phillips screws from the bottom cover. You will find that three of these are long and two are short. The speaker can now be removed by disconnecting it's plug and lifting it out. Remove the two Phillips screws from the metal ROM case and one from it's circuit board. Now carefully lift the ROM case and it's circuit board up and toward the front of the unit. A ribbon cable is attached from this section to the keyboard. Unplug the ribbon cable to separate the two pieces. Next remove the four Phillips screws that hold the keyboard in place and lift it out.

If your function keys are sticking, they will have to be removed. Just spread their locking tabs and pop them out. Using an X-acto knife or single edged razor blade, scrape some of the plastic away from the sides of the key. Check the solder joints on circuit boards (I found a cold solder joint in the space-bar switch).

Reassembling the unit is merely a reversal of the above procedure.

73,

Jim Krutzler, WA2GUM

(Editor's note: We thank jim for this reassuring information. I would recommend that nobody attempt this unless he/she feels comfortable working with PC boards and have at least a little experience with a fine-tipped soldering iron. Also, it wouldn't hurt to wait until the warranty is expired!)

ATARI MICROCOMPUTER NET ORGANIZATION

National Net: 14.325 Mhz at 1600
Zulu, Sundays.
Midwest Regional net: 7.235 Mhz at
1830 Zulu, Sundays.
Southeast Regional Net: 7.235 Mhz
at 1800 Zulu, Sundays.
Southwest Regional Net: 7.230 Mhz
at 1800 Zulu, Sundays.
International Net: 21.400 Mhz
at 2330 Zulu, Thursdays.
Dayton Ohio Local Net: Open channel
daily on 146.445 Mhz. Simplex
Chicago, IL Local Net: Open channel
daily on 147.570 Mhz. Simplex

The International Net will occur on
alternate Thursdays.

Additional nets will be formed as
regional/local organizers volunteer
their efforts. If you would like to
start a regional or local net,
contact WD8BNG for a net
coordinator's packet.

IMPORTANT INFORMATION!!!

The net librarian is now John Adams, KC5FW. By
the time this issue reaches you, all
correspondence should be directed to John.
Previous material sent to Gary, AA5I has been
transferred to John and old business should be
taken care of by now. John's address is: 17106
Happy Hollow, San Antonio, Texas 78232. We
wish John well in his new position within the
net organization and we also hope that Gary's
new employment is going well. Thanks for all
of your help fellows!

A GREAT RTTY MAILBOX!

One of the most pleasurable experiences that I
have had lately is to be able to use the ATARI
in the RTTY mode. This pleasure has been
enhanced several times by the use of an "MSO",
an electronic mailbox in which I can drop off
messages and retrieve messages, news items,
ARRL bulletins etc. at my own leisure! No need
to keep a schedule or miss a call from someone
you wanted to hear from. I was told about a
really great MSO during the 40 meter midwest
net on September 12, 1982. The station making
the report was Paul, WB9FNR, who stated that
he left a notice about our network in the MSO.
The results have been great! I have received
many inquiries because of this message! I am
sure that there are many other MSOs throughout
the country, but I am unfamiliar with them, so
I will give a rundown of the operation of this
particular unit. I do want to hear from all of
you who have access to an MSO, it's
accessability, procedures, etc. I will publish
this information for the benefit of all the
members.

Here is the information on MSO K4CZ:

Frequency: 7.098.5 Mhz.
Rate: 60 baud

THE FOLLOWING CODES ARE USED IN THE MSO

CODE	FUNCTION
.CZZW	TURN MSO ON
.EXIT	TURN MSO OFF
.HELP	GET LIST OF COMMANDS
.FILEHELP	SHOW THE FORMATS OF THE COMMANDS
.KY1ON	TURN KEY 1 ON
.KY1OFF	TURN KEY 1 OFF
.KY2ON	TURN KEY 2 ON
.KY2OFF	TURN KEY 2 OFF
.PRINTON	TURN PRINTER (KY3) ON
.PRINTOFF	TURN PRINTER OFF
.QBF	PRINT 2 LINES OF QUICK BROWN FOX
.READ	READ A FILE BY NAME

.RYS SEND 2 LINES OF RYRYRY
 .SDIR SHORT FORM DIRECTORY
 .WRITE INDICATE THE NAME AND BEGINNING
 OF A FILE
 .ENDFILE INDICATE END OF A FILE

A typical QSO with this MSO might be as follows: MSO responses will be in quotation marks and underlined.

DE WD8BNG (INSERT CW ID) .CZZW
"K4CZ MSO IS ON:

.EXIT - TO EXIT MESSAGE STORAGE OPERATIONS

.HELP - TO PRINT COMMAND LIST

2313 EDT 9/20/82 NEXT?"

.SDIR

"CASEY JONES READ
 BETTER DIPOLES OPEN
 TR-9000 TRADE OPEN
 WD8BNG DE WB8QYT OPEN
 KTSX DE W4HIR OPEN
 ATARI USERS NET OPEN
 2 MT RPT SALE OPEN
 ARRL NR 78 READ

TOTAL OF 64 MESSAGES STORED. NEXT?"

.READ WD8BNG DE WB8QYT

"WD8BNG DE WB8QYT

0922 EDT 9/23/82 133 OPEN

JACK, JUST GOT THE 'AD ASTRA' IN THE MAIL. SURE LOOKS GOOD. WILL COMMENT LATER. THANKS AGAIN AND WILL BE IN TOUCH.

73 DE JEFF WB8QYT

1022 EDT 9/24/82 NEXT?"

.DELETE WD8BNG DE WB8QYT

"FILE WAS DELETED 1023 EDT 9/24/82 NEXT?"

.EXIT

"MSO DEACTIVATED 1023 EDT 9/24/82

BYE DE K4CZ"

DE WD8BNG THANKS HENRY! (CW ID INSERTED) 7

By the way, I forgot to mention the ".DELETE" command. Obviously, it will delete a file that you specify. Try this MSO! It has a night range that extends well into the western areas of the U.S. I am sure that there are others that do as well. 73, de WD8BNG

Perhaps I should point out that the "garbage" at the end of the QSO is what the TU interprets the CW ID as, it wasn't interference or other true "garbage". The "interface" unit that Bill referred to was, of course, the Kantronics "The Interface" that many of our members now have.

S.A.M

Meet S.A.M. Sam is a totally new voice synthesizer that comes on a diskette and enables your ATARI to utter intelligent speech. Once you boot SAM into memory you are ready to enter phonetically spelled words that SAM can convert into speech using sound generator "0". Also included is a program called "RECITER" which accepts plain everyday spelling and which SAM also converts into speech. Claimed accuracy of pronunciation is 90% with improvements on the way. SAM also comes with "SAYIT", a program, which when used with "RECITER", enables you to program speed and pitch. Nice. You can also set inflection which enables you to program in a foreign language and still retain natural-sounding speech. All of this for \$59.95! Also included is a nice manual of instructions and 1500 words of pre-programmed speech for using phonemes. I am quite pleased with the package and recommend it to anyone who wishes to experiment with voice-synthesis at minimal cost. Nothing else is needed to use SAM with the ATARI and backup disks are available in case of disaster for a nominal fee. One minor disadvantage is that the screen blanks out during speech, but nothing is lost from memory. Demo programs are included on the disk..

John Scheurer, WB6WIW

Required: 32K, Disk Drive

CONFUSED?

by Paul Hoffarth, WB9FNR

I have a few things to share with the members. As many of you know, I am using the Kantronics "HAMSOFT" program and IRL FSK-500 TU with my ATARI 400 for RTTY/ASCII operations. I didn't think much of the cable that Kantronics sent with the software-- too short! So, I made my own out of some audio cable 6 feet long from Radio Shack. Also, the cable hook-up for the printer was a bit confusing to me. I have sorted out all of the details for you.

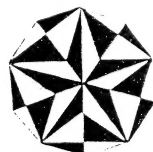
INTERFACING THE ATARI TO THE FSK-500

ATARI GAME PORT # 1	FSK-500
PIN #1 GREEN-DEMOD OUT	DATA OUT
PIN #2 BROWN-P 17	T/R
PIN #3 RED- P 16	SERIAL IN
PIN #4 WHITE-CW KEY IN	KEY IN
PIN #8 BLACK-GROUND	GROUND

MX-80 PRINTER PLUG AMPHENOL 57-30360

ATARI GAME PORT # 3	MX-80 PLUG
PIN #1 DATA 0	PIN #2 DATA 1
PIN #2 DATA 1	PIN #3 DATA 2
PIN #3 DATA 2	PIN #4 DATA 3
PIN #4 DATA 3	PIN #5 DATA 4
PIN #8 GROUND	PIN #16 LOGIC GND.

ATARI GAME PORT # 4	MX-80 PLUG
PIN #1 DATA 4	PIN #6 DATA 5
PIN #2 DATA 5	PIN #7 DATA 6
PIN #3 DATA 6	PIN #8 DATA 7
PIN #4 STROBE	PIN #1 STROBE
PIN #6 ACKNOWLEDGE	PIN #10 ACKN.
PIN #8 DATA 7, GND.	PIN #9 DATA 8



When I looked over the Kantronics instructions, I wondered what I would use for the plugs to game ports 3 & 4? We also have an ATARI home video game for the kids and they were complaining that the joystick controllers were getting old and not working too well. So, I promised to buy them a new set and the old set was stripped of their cables and connectors to use them on the MX-80! It can be difficult to find which pin is connected to what wire, so I am including this information for you:

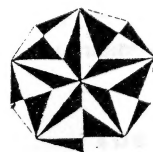
CONNECTOR PIN	COLOR CODE
PIN #1	WHITE
PIN #2	BLUE
PIN #3	GREEN
PIN #4	BROWN
PIN #6	ORANGE
PIN #8	BLACK

ANOTHER TIP!

I use the 410 program recorder and I depend on the number counter for finding my programs on tape. After about two months, the counter started to slip... I discovered that Radio Shack carries a product called NON-SLIP, cat.# 44-1013B, and using a cotton swab to apply the NON-SLIP to the small belts that drive the counter produced excellent results! My problem was solved and I no longer had to take the recorder to the local service center! Good luck!

Paul, WB9FNR

From Rev. John Tucker, WD0BHU
If any members are looking for an elaborate word processing program with editing and text-saving capabilities, yet at a low cost, I would recommend that they purchase "Bob's Mini Word Processor" from Santa Cruz Educational Software. This program is available on tape or disk, and requires 32K. I have used the program for several months and like it very much. The cost is about \$20.....



TRANSIENT VOLTAGE PROTECTION FOR YOUR COMPUTER AND HAM GEAR

Randy L. Agee - W84BZX
Audio-Visual Equipment Service
Route 5, Box 74b
Bedford, Va. 24523

I love summer! Thunder storms, lightning and the resultant damage to customer's electronic equipment from power line surges up to 2000 volts always generate enough extra income for me to take an extra week of vacation in August.

Usually my customers are lucky. These transient voltages only manage to blow the internal equipment fuse and the power supply diode(s). Sometimes they aren't so lucky, delicate CMOS devices or simple silicon devices elsewhere are destroyed resulting to current overloads that do further damage to other components. This is a rather expensive proposition, to say the least.

If you haven't taken the time to look in your hardware manual recently, perhaps you should. Your prized ATARI is full of these delicate CMOS critters and an assortment of other voltage critical components. Not only that, but the engineers at ATARI didn't bother to include a fuse in the computer power supply or the external power transformer! I shudder to think of what a power supply transformer would look like after a session with a shorted diode.

Before you go running down to your local computer supplier and lay out big bucks for a "power line filter" or open a savings account to cover the probable eventual repair of your equipment from transients or "spikes" let's take a second to explore the cause and an inexpensive solution to the potential problem.

Voltage surges, transients, spikes or whatever you want to call them can appear on power lines at most any time. The most frequent cause is a lightning strike near a power line, even miles away from you. In addition, air conditioners, pump motors, refrigerators, etc. switching on and off can create transients, some of which have been recorded as high as 6000 volts on your power lines! Commonly, these transients when applied to a non-conducting PN junction create a irregular heating of the junction that has a tendency to "avalanche". In addition, if a device is operating in it's active region the transient may bring it out of it's safe operating region causing thermal runaway and resultant failure of the component. In a diode, a reverse bias transient can destroy it even without exceeding the PRV rating. As I said before, the electrical activities causing the transient can be well removed from the user's power line giving no warning of the potential damage to come.

Sorry, isn't it?

Enter the MOV. "The what?", you say. The MOV - or Metal Oxide Varistor. This is a small device, looking like a disc ceramic capacitor, that when installed across a 120 volt AC power line, has the ability to safely shunt potentially destructive transients in as little as fifty billionths of a second! As soon as the transient is over, it returns to it's normal state and is ready for the next transient. These little devices are available from your electronics supplier in the General Electric Pro line. My favorite flavor is the GE-750 that retails for under \$5.00. It can be easily installed on the back of a duplex wall outlet by turning off the appropriate circuit breaker and removing the outlet from the wall to install it. My preference for the ATARI is to make up a dual duplex outlet extension cord using a 4" square handi box and cover assembly which allows plenty of outlets for the power supplies, 410 and TV monitor to be plugged into. While you are at it, order some extras for your ham gear, family TV set and sound system.

For those of you who are cautious enough to go the whole 9 yards, pick up some in-line fuse holders at the same time. Break the AC cord feeding your power transformer on your ATARI and with your system under full power measure the current with your AC ammeter. Multiply this reading by 125% for the value of your fuse. Since different systems will have varying current draw due to amount of RAM, etc. you would be better off to make your own measurements. If you do not want to go to this trouble put a 1/4 amp fuse on the 120 volt side or a 2 amp fuse on the 9 volt side.

If your area is subject to frequent electrical storm activity I would further advise two additional precautions in addition to the above. Have your GE dealer order you a Model Number V22ZA1 Varistor to install on the 9VAC side of your supply transformer and purchase from your Square D electrical supplier a Secondary Surge Protector, Catalog #J9200-10 (about \$20.00). This device is installed on your main circuit breaker and may require the services of a licensed electrician or the power company to pull your meter from the socket. The above protector may be installed on an individual branch circuit but is not as effective. General Electric markets a similar device (GE9L15) for about the same price.

Reference: General Electric Transient Voltage Suppression Manual and GE MOV Varistors Selection guide, 1976

TESTIMONIAL!

This is a verbatim transcript from a QSO that I had with member Bill Janovsky, KG2L in the ASCII mode at 110 baud. Date: July 11, 1982
Time: 2345Z Frequency: 14.087 Mhz.

W8BNG DE KG2L

FB JACK IT IS REALLY A SUPRISE TO SEE YOU HERE! I HAVE BEEN DOING A LOT OF RTTY OPERATING WITH THIS INTERFACE. THIS IS THE FIRST TIME THAT I HAVE USED THE ASCII MODE. IT CERTAINLY IS DIFFERENT. I HAVE BEEN MAKING LOTS OF DX QSOS IN THE RTTY MODE. IT REALLY WORKS WELL... I HAVE HAD A LOT OF GUYS ASK ME ABOUT MY SETUP SINCE THEY HAVE NEVER HEARD AN ATARI COMPUTER HERE ON THE RTTY MODE. YOU ARE THE FIRST OF THE GUYS THAT I HAVE WORKED-- I WONDER IF THIS IS THE FIRST ATARI TO ATARI CONTACT? BK TO YOU JACK W8BNG DE BILL KG2L, BAYSHORE, NEW YORK *****MOOOO

Perhaps I should point out that both Bill and myself were using the Kantronics "The Interface"! Since that time, I have had many RTTY/ASCII QSOs with members using this unit and/or software. Also, the "garbage" at the end of the transmission is what the TU interprets the CW ID as while in the RTTY/ASCII mode. It wasn't interference of other true "garbage". Jack, W8BNG

by Claus Buchholz

Reprinted from the "MACE NEWSLETTER", September 1982

[Editor's note: ATARI, Inc. does not recommend that you try the following modification. After all, they don't even acknowledge that a '400 can be upgraded to 32K, much less 48K. Need we remind you that actually opening up the case and playing with the insides will void your warranty? This modification is not for the fainthearted or the clumsy-- one little "Oops!" and your '400 is DOA. We at MACE cannot even vouch that the mod works as we have not ourselves tried to duplicate the author's success.

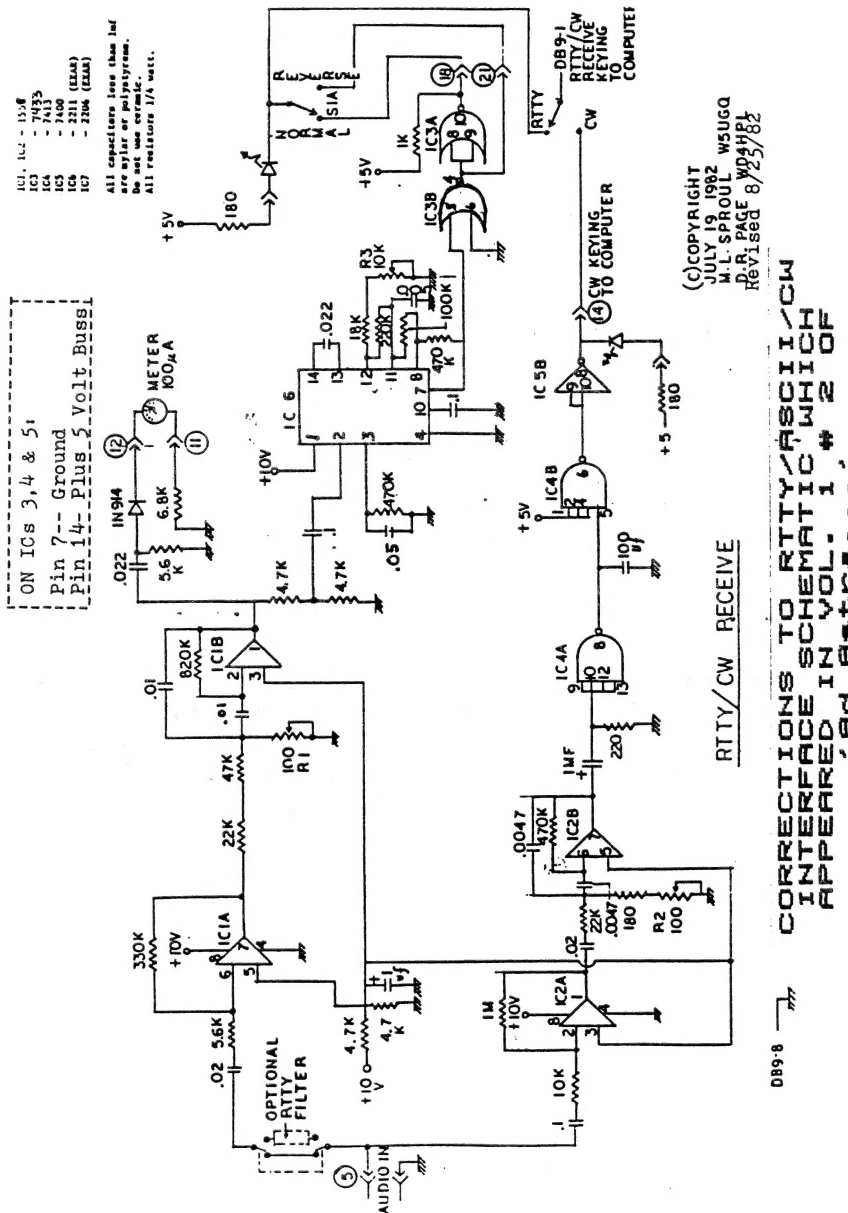
Nonetheless, we know that among our members there are a few incorrigible hackers who think that hardwired spaghetti improves the machine's aesthetic value, as well as some who can't resist a bargain. Although we don't want to encourage you, we would rather have you down in the basement ripping your computer apart than out on the streets where you might do some real harm. So in the interest of public safety, we publish the following article. We suggest that you have a hardware manual handy as well, to refer to the schematics and block diagrams. After all, you've got almost \$250 invested in your computer!]

None of us needs to be reminded of the awesome power of the ATARI personal computers. What many fail to realize is that, except for the full-stroke keyboard and greater configurability of the '800, the ATARI 400 shares all of the power of her big sister. The high performance/price ratio of the '400 makes it a very attractive computer.

The 16K RAM supplied (8K in earlier models), however, is simply inadequate for many users' needs. ATARI designed the '400 to address 32K but they don't sell 32K boards. Other manufacturers sell 32K and 48K boards, but their added cost severely decreases the performance/price ratio that distinguishes the '400 from other computers.

I have designed and implemented a 48K upgrade for the '400 that you can add for about \$70 and a few hours work. With 48K, you can run nearly every program written for the ATARI computers, including that program you've not finished writing because, "It won't fit!"

The modification is based on the idea of replacing the existing 16K-bit (or 8K) RAM chips with the newer 64K-bit devices. These dynamic RAMs are operationally compatible with the 16K chips. Note the two major differences: The 64K RAMs have an additional multiplexed address pin to access the larger memory. Also, they need only a single 5V power supply as opposed to the 5V, 12V and -5V



CORRECTIONS TO TRANSMIT SECTION
APPEAR ON PAGE 26

CORRECTIONS TO RTTY/ASCII/CW
INTERFACE SCHEMATIC WHICH
APPEARED IN VOL. 1, # 2 OF
MACE NEWSLETTER

supplies which the 16K RAMS use (see Figure 1 for a pinout comparison).

Some circuitry must also be added to allow the '400 to address 48K. Note that the new RAM chips can hold 64K of memory, but the ATARI only addresses 48K. If you can't bear to waste the extra 16K, see the suggestions later in the article.

The parts listed in the Parts List are available from many mail order houses who advertise in the back of most computer magazines. You will also need a fine-tipped soldering iron, an ohmmeter, small pliers, screwdrivers, solder, fine wire, and a clean and static-free place to work. You should have a little experience in working with electronics. If you don't find a friend who does and could help you.

The first step is to open your '400. Disconnect all cables. Turn the '400 over and remove the four screws in the underside of the plastic case. While holding the case together, turn it over again. Open the cartridge door and remove any cartridge, leaving the door open. Lift the rear of the top-half of the case over the door. To remove the case top from the keyboard, press on the bottom of the keyboard on either side until it bends, and slide the keyboard away from you. The case top should now be free. Now remove the keyboard by pulling straight up on the flexible connector under the right side of the keyboard.

The circuit board on the right is the power supply. The computer is inside the metal case. Remove the two screws that fasten the left side of the power supply board to the right side of the metal case. Gently, but firmly pull up the left-front side of the power supply to disconnect it from the main board on the bottom. Be careful of the plastic interlock switch plunger when moving the power supply board. Now remove the speaker connector from the left-front of the main board, and lift the metal case out of the plastic bottom.

Turn the metal case over and remove all the screws in the bottom plate. Now pull the main circuit board up and out of the metal case, taking care not to flex the board. You may have to gently pry the edges to loosen the board from the metal case.

You will now see the '400 in it's full splendor. Lay the main circuit board down so the joystick ports face you. The smaller boards sticking up are memory board and CPU board. The one nearer you is the memory board. Unplug each, again being careful not to flex the circuit boards. You may also remove the beige plastic piece on the main board by bending it's prongs underneath the board.

Look at the CPU board. It has three large chips. The middle one is the CTIA or GTIA. If you want to replace your CTIA with a GTIA, now is the time to do it. The CPU board is not altered in this memory upgrade, so put it away.

Look at the memory board. The eight chips along the top are the RAM chips. The other four chips are the addressing circuitry. The edge pin connectors at the bottom are labeled as in Figure 2. If you have an 8K '400, you must alter the memory board before proceeding with the upgrade. Instructions for this modification appear at the end of the article.

The first step in the 48K modification is to eliminate the 12V and -5V sources on the board and move the 5V source to where the 12V used to be. As shown in Figure 3, cut the trace going from pin "X" of the board's edge connector to the capacitor C521. Also cut the trace going from edge pin "Y" to C523. Cut the traces cleanly and completely. Be careful not to slip and damage adjacent traces.

Now remove the capacitors C521 and C523. The trace coming from pin "W" carries 5V. Using a short piece of wire, make a solder bridge between this trace and the old 12V trace, at the point where C523 used to be (see Figure 3). Next, remove the eight capacitors C503, C505, C507, C509, C511, C513, C515 and C517, which are usually in a row along the top of the board.

We now have 5V going to pins 8 and 9 of the RAM chips, and no connection to pin 1. Remove the eight RAM chips and insert the 64K RAMS in their place, properly orienting the notched ends. With an ohmmeter, make sure there is no connection between edge pin "Y" and pin 8 of the chips, nor should there be any connection between any two of the edge pins "W", "X" and "Y".

If all has gone well, the board should be functioning exactly like a 16K memory board, since the addressing circuitry has not been altered. Now may be a good time to test the board (particularly the new RAM chips). If you wish, reassemble the entire computer and check to see if it works properly as a 16K '400. If it doesn't work, recheck all connections and disconnections made so far.

Now take the 5V supply off pin 9 of the RAM chips. To do this, cut the rightmost wide trace on the chip-side of the board (see Figure 4).

Pick up the 74LS158 chip, which is the same as the chips 2503 and 2504 on the memory board. With needlenose pliers, carefully bend up all pins except 1, 8, 15, and 16 (see Figure 5). The remaining four pins are to be soldered to the chip 2503. Remove the chip at 2503 from it's socket and place the 74LS158 on top so that the four pins listed above touch the same four pins on the lower chip (as in Figure 5). Carefully, solder each of the four pairs together, being careful not to get too much solder on the end of each pin.

Now solder a 4" length of wire to each of the pins 2,3 and 4 of the top

chip. Reinsert the chip pair at Z503. Solder the wire from pin 2 into the hole attached to edge pin "M", and the wire from pin 3 to edge pin "U". Next solder the wire from pin 4 to a hole in the former 5V bus, the wide trace along the top of the chip side of the board.

The memory board is now complete. With an ohmmeter, check all connections diagrammed in Figure 6.

The final stage involves modifying the main (mother) board itself. To help you visualize this stage better, I have included a partial schematic in Figure 7, and a pin diagram in Figure 7a. Locate chip Z103 forward of the memory slot (see Figure 7a). On the underside of the board, cut the traces leading from pins 1 and 2 of Z103. Now attach a wire from pin 24 (across from pin "BB") on the underside of the CPU board slot to pin "U" under the memory slot. Attach a second wire from pin "CC" under the CPU slot to pin "M" under the memory slot.

Now wire the circuit of Figure 7, using the pin diagram of Figure 7a. On the 14-pin socket, solder pins 3 and 4 together with a short piece of bare wire. Do the same with pins 2 and 13. Next solder an 8" length of wire to each of the pins 1, 5, 6, 7, 11, 12 and 14. With these wires, make the six connections to the underside of the cartridge slot as diagrammed. The seventh wire from pin 1 goes to pin 18 on the underside of the memory slot.

Plug the 74LZ02 into the socket and bend the wires around some notches on the edge of the main board, between the crystal and cartridge slot. Finally, solder one of the 680 Ω resistors between pin "A" under the cartridge slot and the nearest ground connection. Be especially careful that excess solder does not form "bridges", making electrical connection where none should exist. Put the second 680 Ω resistor between ground and pin 14 under the cartridge slot.

The modification is finished. Recheck all connections, as an improper connection may damage the computer. Reassemble the computer, being careful that the 74LS02 chip doesn't touch any other circuitry. It's a good idea to wrap the chip in electrical tape.

Plug in the '400 and turn it on. If the blue screen doesn't come up quickly, turn it off immediately and check that your work, including reassembly, has been done correctly. If you have exercised proper care, you should now have 48K of RAM for your '400. Enjoy!

MODIFYING AN 8K BOARD

Near the center of the board are six pair of holes marked A through F in which two resistors reside. Remove both resistors. If one of them is at C, leave it there. Otherwise, solder one of the removed resistors at C. Now solder a wire

FLASH!! Dave, KD8Z has done this modification and says it works great!!!!

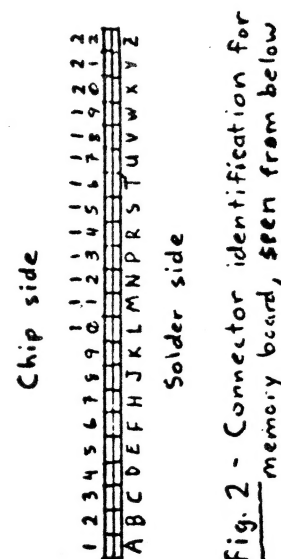


Fig. 2 - Connector identification for memory board, seen from below

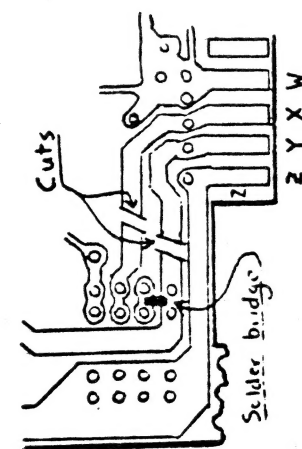


Fig. 3 - Lower left corner of solder side of memory board

PARTS LIST

QTY	ITEM
8	4164 200 nanosecond dynamic RAM
1	74LS158 quad 2 to 1 multiplexer
1	74LS02 quad NOR gate
2	680 ohm 1/2 watt resistor
1	14-pin DIP solder tail socket

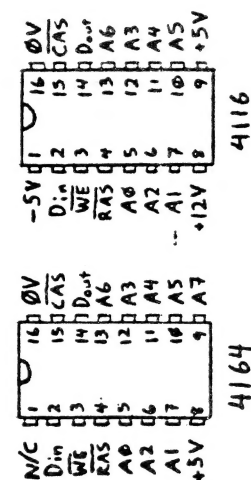


Fig. 1 - Pinout comparison of 64K- and 16K-bit RAMs

from edge connector pin "H" to the trace that connects holes D,E and F together.

Next, cut the trace leading to pin 13 of the chip at Z501, and solder a wire from this pin to edge connector pin "U". The board is now ready to be modified for 48K as described above.

SUGGESTIONS FOR A 64K MODIFICATION

Figure 8 shows a circuit that will allow you to access the unused 16K on your modified board. After you have successfully completed the 48K modification as described above, disconnect the wire you put between edge pin "U" and pin 3 of the 74LS158. Wire the circuit of Figure 8 in it's place.

Two more chips are needed for this circuit, a 74LS00 quad NAND gate, and a 74LS74 dual flip-flop. They may be wired to the memory board using sockets as you did with the 74LS02. The NOR gate on the left is from the 74LS02 chip you wired to the main board. You may bring it's output to the memory board through an unused edge pin such as pin "V".

The extra 16K is bank switched with the middle 16K of the 48K RAM. By writing a 1 to a memory location between D700 and D7FF (55040 to 55295 decimal), you replace the middle 16K of your 48K with a new bank of 16K. When you write a 0 to the same location, you get the original bank back. This is best done in machine language, since you can confuse BASIC by switching out part of a BASIC program.

Although you must be careful in using this extra 16K, it can come in very handy for storing extra graphics screens or other kinds of data. I have not yet implemented this 64K modification, so I leave it to the more adventuresome of you to build, test and use.

FINAL NOTES

When a cartridge is inserted into the '400, the addressing circuitry disconnects the top 8K of RAM. For example, with the BASIC cartridge you only have 40K of RAM. This is normally the case with the '800 also. If ATARI ever comes out with a 16K ROM cartridge, it will properly disable the top 16K of RAM when inserted.

Remember, that performing this modification will void any warranty remaining on your '400. If you just can't get the modification to work, you may repair all the cut traces, remove added circuitry, and insert the original RAM chips to restore your '400 to it's original condition, assuming nothing was damaged.

PULL-OUT

Last - Minute Info!!

MORE NEWS!

NEW KEYBOARD UNITS!

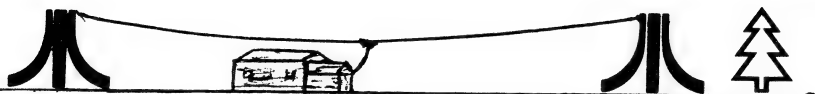
There are two new Keyboard units available for the ATARI 400/800 system! The first of these is made for either model. SCREEN SONICS, 11416 S. Outer Rd., Chesterfield, MO 63017, (314) 434-0433, calls their unit the "Sidewriter". Made to connect by a cable from it's self-contained cabinet to your computer console, this keyboard has a full-function, full stroke keypad that must be wired to your console by cables supplied by yourself, through a "conversion kit" supplied by the manufacturer, or can be factory installed. According to Sheldon, N8SL, this unit has a fine feel and everything works as specified. The only difference in the layout of the board is the reversal of positions of the ATARI logo key and the right shift key. Price range is \$169 for the bare keyboard to \$249 for the entire unit factory installed with all cables and connectors.

The second of these units is from a company formerly known as COMP-AL-CO, now MICROTRONICS, 2343 Kodiak, Ft. Collins, CO 80525. According to their news release, this unit is a direct replacement for the ATARI 400 membrane unit. Just snap out the old one and fits on the old keypad hole. The release says that this unit has full-stroke keys like the 800 and that all special functions are available. The price on this unit is very competitive- \$129.

MEMBER'S HARDWARE DEVELOPMENTS

Member Phil Salas, AD5X, has started a company known as "CREATIVE FIRMWARE". Their purpose is to make available to ATARI users a truly flexible FIRMWARE SYSTEM- right down to the OPERATING SYSTEM BOARD! According to Phil, the OS has a 4K open area between C000 and CFFF that can contain additional OS instructions. Phil has created a new OS board that will allow you to add your own instruction set or 4K mini program which can be called up at will! All 14K of OS ROM space is provided with 4 EPROMS on the board.

Phil's second announcement is an EPROM card that fits into your front ROM slots in the 400/800. Using an EPROM or PROM you can custom-build your own machine language program cards! This card is very flexible allowing the user to put programs from 2K to 8K onto the board!



The third kit available from Phil is an EPROM PROGRAMMER board to allow you to make all of those custom firmware packages for immediate boot-up! This programmer connects to the joystick ports of your ATARI. Simple commands allow you to read, verify and program EPROMS.

Prices for these marvelous Kits are as follows: OS EPROM BOARD (all parts less EPROMS): \$59.50
 CARTRIDGE EPROM BOARD (all parts less EPROMS): \$12.89
 EPROM PROGRAMMER KIT (all parts less case): \$69.00
 Also available are 2716 EPROMS and 2352 EPROMS at \$4.50 and \$10.00 respectively.

As an added bonus, Phil says that members of the net can obtain these Kits at a 10% discount from the retail price of the units. Members interested in these fine Kits may get more information from Phil by writing to him at: 707 Auburn Drive, Richardson, Texas 75081. Or call him at (214) 699-8571

NEW RTTY SOFTWARE!!!

Member Bob Holsti, K7ZJD/KH2, has developed a series of RTTY/ASCII programs for the ATARI! Bob has a drilled PC board available for a modem (TU) for on-the-air use of the ATARI system! He also has RTTY/ASCII programs that utilize the disk drive system to load files into the message buffer! A data file writer and reader utility are included as are a program that lays out the schematic of the modem, prints and labels all components in graphics 8 mode! Fantastic! Bob says that he has been on RTTY and ASCII for three years with his ATARI... looks like Bob was one of the pioneers! The price of Bob's software package is only \$25!. If you would like to explore this program further or inquire about the modem board that Bob has produced, contact him at Box 4426 AAFB BR, Yigo, Guam 96912 U.S.A.

Another member, Robert Edwards, K2GTE, 26 Antioch Dr., Shoreham, N.Y. 11786, has put together a commercial quality set of RTTY programs for the ATARI! There are two versions available- a disk-based version with many enhancements and good utilization of the disk drive unit. Loading text files is one of the best features. Robert also has a tape-based version for those who have the tape drive. Of course, this version does not have the file loading capability. These programs are available for \$29.95 in the tape-based version, and \$49.95 for the disk-based version.

I urge all of the members to contact these fellows and explore the new possibilities now being afforded to ham radio utilization of the ATARI computer system! I hope to be able to give a comprehensive review of all of these products in the next issue of "Ad Astra...". If any of you have obtained these products and would like to give a review of their utilization, I would be happy to print it in the next issue. Remember, by supporting these developers, we will be deepening the foothold that our system has on the marketplace and thereby improving our own lot in the future! If these products are widely accepted in the commercial market, it will induce these fellows to continue their research and development for the next generation of peripherals for the ATARI!

Membership list as of October 1, 1982

Jack McKirgan II WD8BNG	Rev. John Tucker WD0BHU	Gary Smith KA1J
Randy Agee WB4BZX	Bob Lambeck WD8INT	John Adams KC5FW
George Curtis K9GQ	John Scheurer WB6WIM	Leo Kleiman W6KGP
Dennis Erickson WA9FBC	Howie Goldstein N2MX	Arnold G. Wyatt N8AW
Bill Zaner WB6IYS	Oscar Staudt WB5GCX	Jon Stewart
Ron Kolmodin K9OUU	Ken Heneley WA0ZCA	Paul Heflin KC4ZR
Ron Berger NE6T	Neal Eckhardt WB2EKP	Ed Reynolds WB3ERE
Don Page WD4HPL	Earl Glines KC7DG	Bob Martinson N0AFY
Dave Krick K8FJ	Jack Prince WA6QWP	Stan Horzepa WA1LOU
William Jones K7DS	Cam Whetstone WA3YOH	Fred Maia W5YI
C.T. Ashley AA4A/8	Paul Gernhardt KE6LR	Bill Randolph W8VFT
David Voit WB6TOU	Sherman Hart W5BLB	Larry Mosier W9SNM
Stephen Lewis WB7TFZ	Al Kopec KB2NG	Carl Wallis N5DXV
Bruce Crawford WA3NUL	Mike Pars KA3HLS	Damon Ginbey N5GM
Jeff Wilkes WANFA	Walt Ibbotson WD8DYU	Ray Gyger II KX5Z
Jerry Ragland WA8BOB	Bill Janovsky KG2L	Ron L. Stoneman KC8TE
Jack Whitmer	Allen L. Pomerance WA9SUG	Walt Du Bose K5YFW
Alan Orr	Dick Lee W9NUU	Jack Samsa AJ8D
Sheldon Leemon N8SL	Mike Felack WA3NOM	Al Kruhm K2BSM
R.C.Beckett W9OE	David B. Flinker WB4JUG	Roy J. Lewis KA7LWS
Ali Yashruti	Scott Persson WB0QPP	Stan Owens W2MT
John Sherman K1GTE	Bill Reed WD0ETZ	Andy Dichter WB9MSK
Robert Grundner K1RPC	Alan Forney WB4ZKX	Lou Williams WA8UWM
Hal Adkins	Bill Spires KB9UR	Charles Barnes WA6KHY
Gary Sewell AA5I	M/Sgt. Gerald Kaplan KL7IFR	Victor Knoth DA2VK/KB6TE
Lorin Hollander WA1PGB/2	Hugh H. May Sr. WA4KLQ	Nate Schneider WD8MOI
Ed Stephenson AB4S	Dave Bastress K3GAU	Macrotronics Inc.
John Crane WA6ICB	Ted Tarantino KB7DB	Mel Boreham HP2XMK
Don Moon N6FTR	Paul Gilka WD4BIT	Tom Gutekunst N9TG
Ken Gray KC8EL	Mario Schurmann WA7SKV	William J. Lawrence WA4RXD
Phil Salas AD5X	Dave Hartman KD8Z	Pete Inskeep N1ABB
Lee McPherron KC0JS	Doug Seyler WB5TKI	Melvin G. Seyle Jr. WA3KZR
Tom Rice WB6BYH	Matt Wald KA8CGE	William Gilroy WB2LFV

Lynn Reynolds KA5JSM
 Dick Brown KT6X
 Jim Krutzler WA2GUM
 Rev. Gil Gilmore KB4EY
 Doug Renwick VE5RA Aug
 Harold Burba N6AXQ
 Ron Antwiler KB0MP
 Bill Sepkowski N2CZW
 Bill Loviska WD8RIN
 Nathan Olson WA6RHT
 Jeff Hawley W2HRA
 Paul Valentino K4FPF
 Al Smith WA1GPZ
 Chuck Fross N8BSE
 Steve Otto WB0KBA
 Randy Vold KA0EWQ
 Paul Eiden Jr. N4EEL
 Barron Littlefield AK1F
 John Richards KB4HJ
 George Tyler Jr. W6CUI
 Bill Manke KB9NG
 Russell Grockett WA4EFH
 John Schooley K2NC
 Joe France N9BNO
 Joe Savage
 Nick Balovich K50GU/4
 Joe Pawlowski N6AGB
 John Kirkham KC4B
 Ski Brozowsky N6ADI
 Bob Holsti K7ZJD/KH2
 Ed Schmitzer K8TU
 Fred Amis N4ELQ
 Jack Bly KA8D
 Dennis Herman KA4ATK
 Dave Wakefield WA3LEE
 Jim Stafford AA8B
 Terry Osborn KD8B
 Jeff Pops WB9QYT
 Charley Cowden W5GA
 Ken Fuqua KD4MM
 Aubrey M. Clarke W80KV
 Richard Castle N9BU
 William Karlson
 Attn- Lynn E. Carlisle
 Mike Narges KA8CMP
 Curtiss G. Sims KC5CQ
 Paul Grill KA4MRI

Peter Phillips KB2DE
 Ray Conway W6WNA
 Nick Gollobitz N0DZB
 Johnnie Spotts W6HTY
 Otto Pfeffer KA2BPS
 Martin Schick KA4IWG
 Chester Jaffee
 Terry Mayer KI2B
 Arthur Nelson WA6SNK
 Jack Tobias N6BBR
 Duane Olexa WD8OYF
 Fred Siebert K3PNL
 Mike Caswell WA8ARS
 Alan Flaten KD4DB
 Ed Steeble K3IXD
 David Newborg N2DN
 Jim Lamb KD6QM
 George Foehringer WB3IDU
 Keith Savoy WD4PSO
 Victor Gaines KA0EEE
 Dick Raymond WA7CTY
 Paul Hoffarth WB9FNR
 Greg Hodson K7KJM
 Larry Marcy WA4RTX
 Charlie Furdella N3AVK
 John Farber KG6I
 John Crawford K0GH
 Leonard Hodges KA4NXJ
 Ron Vanke KBYAH
 W.E. Welch W8LLU
 James Cox WA0MWP
 Doug Brede W3AS
 Owen Shedd W2WRC
 Jim Jang WD6ESB
 Gus Billmaier W8SMD
 Al Kutka WA2NSM
 Pete Dixon WB6OIP
 Dr. Thomas Wolf KA0GHV
 Nick Kennedy WA5BDU/0
 Stan Molstad
 Jeff Gulick KA3EZG
 William Strauss KA7NIM
 Daniel Samaras KA9LVI
 Leo Hopwood KB2NE
 Phil Airy KA0MOR
 Walter Boger WD4FYB
 Brett Coningham AB5P

Robert Edwards K2GTE
 Martin & Pam LeClerc
 Glenn Varner W4PBQ
 Scott Landin KA8HWP
 Jay Landin WD8PUD
 Ed Wanat WB0UNG
 Ron Stoneman KC8TE
 James Meuse K1PAW
 Bob Patton WA8KIF
 Gene Hawthorn W0MUM
 Lewis Anthony WA8ENU
 Ric Walsh WD8MSJ
 Harry Bluestein N6TE

WHEW!

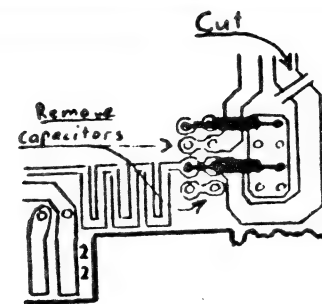
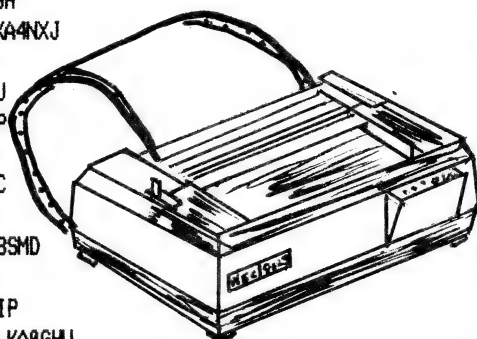


Fig. 4 - Lower right corner of chip side of memory board

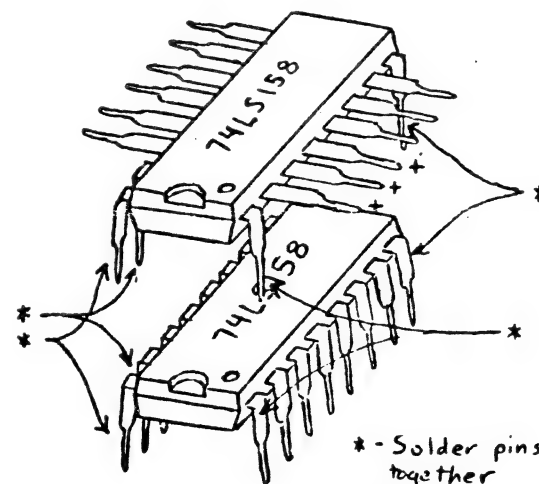
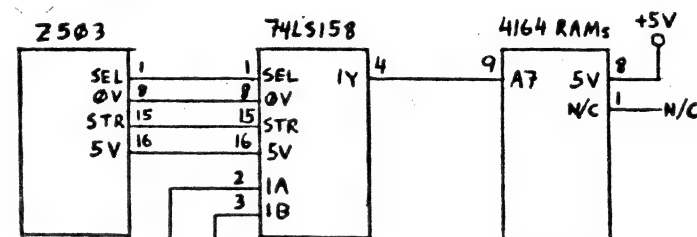


Fig. 5 - Piggyback arrangement



edge pins: M U

Fig. 6 - Schematic for memory board modification

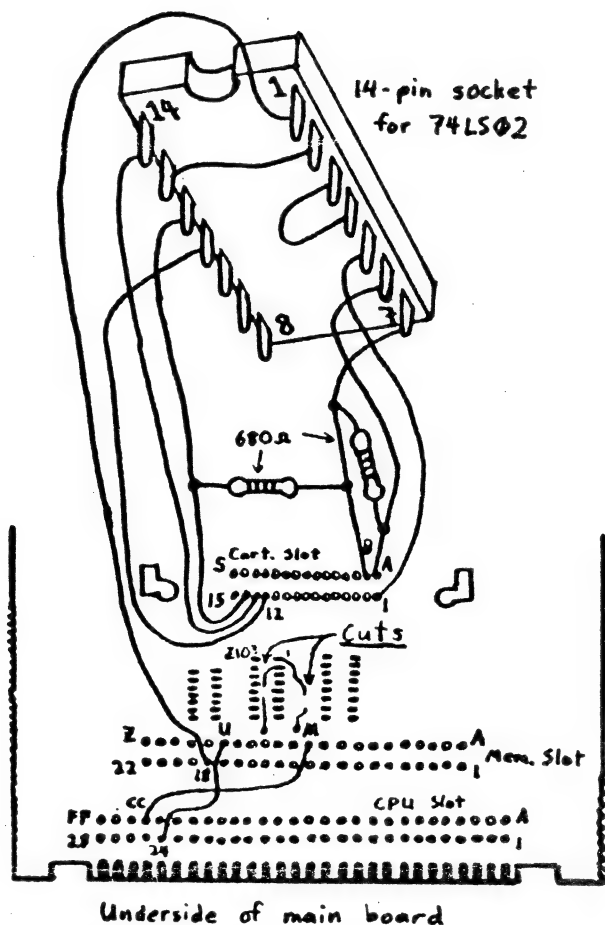


Fig. 7a - Connections for main board modifications

FLASH!! ATARI has started sending ALL 800s with 48K from the factory at the same price! de Duane, WD80YF

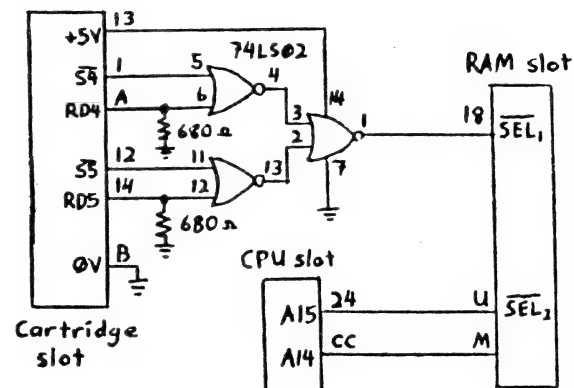


Fig. 7 - Schematic for main board modification

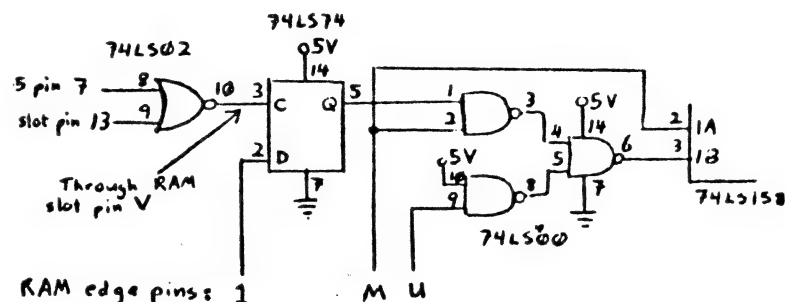
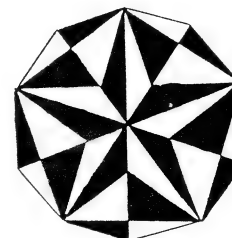


Fig. 8 - Schematic for 64K modification



THE KD7S CW RECEIVE PROGRAM

As stated in issue # 2 of "Ad Astra...", a strong desire to experiment with my ATARI 800's ability to copy CW off the air prompted the design of the KD7S CW INTERFACE and the accompanying program. Again, It should be pointed out that neither the hardware nor software represent the ultimate in "state-of-the-art" technology. They do work, however, and will serve as an entry-level system.

PROGRAM OVERVIEW

The software begins by establishing a relationship between a dot and a dash as a function of time. These values are fixed in nature which means there is no AUTO-SPEED tracking facility. However, variations as great as + or - 10 WPM can be accommodated without a problem. Once the basic dot/dash ratio is established, the program proceeds to actually decode the incoming Morse. It does this by increasing the value stored in the variable "Z" as a function of subsequent dots and dashes being received. When a space is detected, the value of "Z" is used as an address and the program jumps to the appropriate line number ranging from 1000 to 2356. If the program does not understand an incoming morse character, it will print an asterisk in place of that character. This is a hedge against sloppy sending, the effects of QSB or any other anomaly in the received CW. Although no absolute lower and upper speed limits have been established, I have personally copied machine-sent CW at 40 WPM with perfect copy. The primary limitation is the inability of ATARI 8K BASIC to run fast enough to decode the incoming morse. For those of you who share my penchant for ASSEMBLY LANGUAGE, perhaps you would like to rewrite this software and eliminate the problem.

USING THE PROGRAM WITHOUT THE INTERFACE

It is possible to experiment with this program without benefit of the hardware interface. Just load the program into memory and plug a joystick into port # 4 (rightmost). Type RUN and after the black background appears, use the FIRE BUTTON as a telegraph key. It will take the program a few dots and dashes to initialize itself then you will see what you are sending. If you see nothing but the letter "E", it means that the program didn't initialize properly. Anytime you want to re-initialize, just press the SPACEBAR! If you get carried away and completely fill the screen, the program will automatically clear the screen and start over. If you have built the interface, connect the output to the STRIG 3 pins on the joystick jack. Tune in an incoming CW signal and sit back and watch. Again, if you get garbage, simply press the spacebar.

FINALLY

This system has been used to demonstrate just how easy it is to copy CW using your ATARI. Try it yourself..... it's fun!

THE KD7S CW COPY PROGRAM by Bill Jones, KD7S

```

10 X=0:C=0
15 GRAPHICS 1+16
20 PRINT #6;"*":POKE 764,255:IF STRIG(3)=0 THEN 20
30 IF STRIG(3)=1 THEN 30
40 X=X+1:IF STRIG(3)=0 THEN 40
50 C=X:X=0
55 IF STRIG(3)=0 THEN 55
60 IF STRIG(3)=1 THEN 60
70 X=X+1:IF STRIG(3)=0 THEN 70
80 D=X:X=0
90 IF C/D/2 THEN A=C:B=D:GOTO 110
100 IF C/D*2 THEN A=D:B=C:GOTO 110
104 GOTO 55
110 X=0:IF STRIG(3)=1 THEN 110
120 X=X+1:IF STRIG(3)=0 THEN 120
130 IF X/AX2 THEN Z=1000:X=0:GOTO 150
140 Z=2000:X=0
150 TRAP 6000:X=X+1:IF X>A THEN GOTO Z
160 IF STRIG(3)=1 THEN 150
170 X=0
180 X=X+1:IF STRIG(3)=0 THEN 180
190 IF X/AX1.5 THEN Z=Z+100:X=0:GOTO 210
200 Z=Z+200:X=0
210 TRAP 6000:X=X+1:IF X>A THEN GOTO Z
220 IF STRIG(3)=1 THEN 210
230 X=0
240 X=X+1:IF STRIG(3)=0 THEN 240
250 IF X/AX1.5 THEN Z=Z+10:X=0:GOTO 270
260 Z=Z+20:X=0
270 TRAP 6000:X=X+1:IF X>A THEN GOTO Z
280 IF STRIG(3)=1 THEN 270
290 X=0
300 X=X+1:IF STRIG(3)=0 THEN 300
310 IF X/AX1.5 THEN Z=Z+1:X=0:GOTO 330
320 Z=Z+2:X=0
330 TRAP 6000:X=X+1:IF X>A THEN GOTO Z
340 IF STRIG(3)=1 THEN 330
350 X=0
360 X=X+1:IF STRIG(3)=0 THEN 360
370 IF X/AX1.5 THEN Z=Z+35:X=0:GOTO 390
380 Z=Z+55:X=0
390 TRAP 6000:X=X+1:IF X>A THEN GOTO Z
400 IF STRIG(3)=1 THEN 390
410 X=0
420 X=X+1:IF STRIG(3)=0 THEN 420
430 IF X/AX1.5 THEN Z=Z+70:X=0:GOTO 450
440 Z=Z+90:X=0
450 TRAP 6000:X=X+1:IF X>A THEN GOTO Z
460 IF STRIG(3)=1 THEN 450
1000 PRINT #6;"E";X=0:GOTO 5000
1100 PRINT #6;"I";X=0:GOTO 5000
1110 PRINT #6;"S";X=0:GOTO 5000
1111 PRINT #6;"H";X=0:GOTO 5000
1112 PRINT #6;"V";X=0:GOTO 5000
1120 PRINT #6;"U";X=0:GOTO 5000
1121 PRINT #6;"F";X=0:GOTO 5000
1146 PRINT #6;"5";X=0:GOTO 5000
1166 PRINT #6;"4";X=0:GOTO 5000
1167 PRINT #6;"3";X=0:GOTO 5000
1177 PRINT #6;"2";X=0:GOTO 5000
1200 PRINT #6;"A";X=0:GOTO 5000
1210 PRINT #6;"R";X=0:GOTO 5000
1211 PRINT #6;"L";X=0:GOTO 5000
1220 PRINT #6;"W";X=0:GOTO 5000
1221 PRINT #6;"P";X=0:GOTO 5000
1222 PRINT #6;"J";X=0:GOTO 5000
1227 PRINT #6;"?";X=0:GOTO 5000
1237 PRINT #6;"SK";X=0:GOTO 5000
1247 PRINT #6;"AR";X=0:GOTO 5000
1277 PRINT #6;"1";X=0:GOTO 5000
1337 PRINT #6;".";X=0:GOTO 5000
2000 PRINT #6;"T";X=0:GOTO 5000
2100 PRINT #6;"N";X=0:GOTO 5000
2110 PRINT #6;"D";X=0:GOTO 5000
2111 PRINT #6;"B";X=0:GOTO 5000
2112 PRINT #6;"X";X=0:GOTO 5000
2120 PRINT #6;"K";X=0:GOTO 5000
2121 PRINT #6;"C";X=0:GOTO 5000
2122 PRINT #6;"Y";X=0:GOTO 5000
2146 PRINT #6;"6";X=0:GOTO 5000
2147 PRINT #6;"7";X=0:GOTO 5000
2166 PRINT #6;"BT";X=0:GOTO 5000
2200 PRINT #6;"M";X=0:GOTO 5000
2210 PRINT #6;"G";X=0:GOTO 5000
2211 PRINT #6;"Z";X=0:GOTO 5000
2212 PRINT #6;"Q";X=0:GOTO 5000
2220 PRINT #6;"O";X=0:GOTO 5000
2246 PRINT #6;"7";X=0:GOTO 5000
2256 PRINT #6;"8";X=0:GOTO 5000
2257 PRINT #6;"9";X=0:GOTO 5000
2277 PRINT #6;"0";X=0:GOTO 5000
2356 PRINT #6;"*";X=0:GOTO 5000

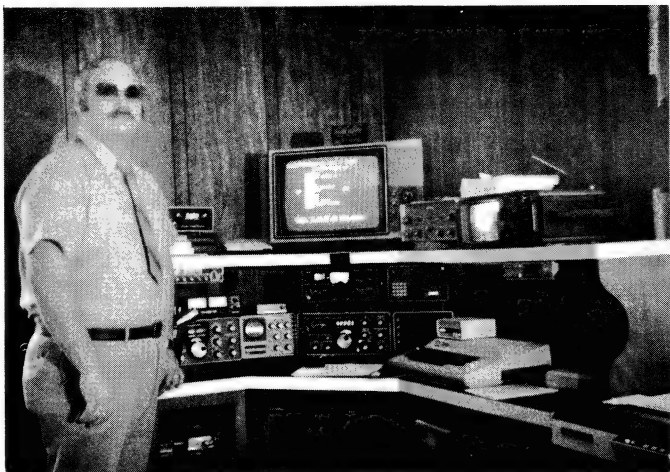
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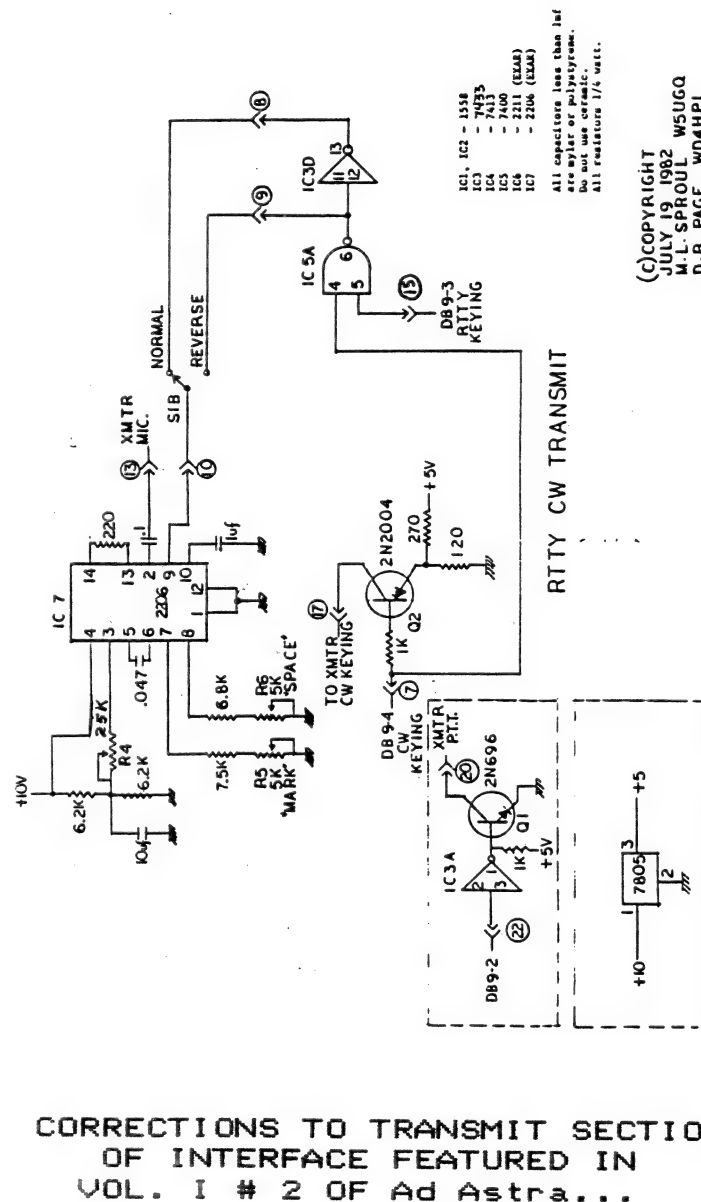
5000 C=C+1:IF C>480 THEN PRINT #6;"":C=0
5001 IF STRIG(3)=0 THEN 120
5002 P=PEEK(764):IF P<>255 THEN 20
5003 IF STRIG(3)=1 THEN X=X+1:IF X>A THEN PRINT #6;" ";:C=C+1:GOTO 110
5004 GOTO 5001
6000 PRINT #6;"X";:X=0:GOTO 5000
7000 REM *****
7001 REM *** THE SYMBOL ) IS A ***
7002 REM * CLEAR SCREEN COMMAND *
7003 REM * AND RESULTS FROM THE **
7004 REM * ESC-CTRL-CLEAR KEYS **
7005 REM * BEING PRESSED IN THAT *
7006 REM ***** ORDER *****
7007 REM *****
7008 REM *****
7009 REM *** THE AR, SK AND BT ***
7010 REM ** CHARACTERS SHOULD BE *
7011 REM ** ENTERED IN INVERSE ***
7012 REM ***** VIDEO *****
7013 REM *****
7014 REM *****
7015 REM ** AN ASTERISK (*) IS ***
7016 REM ** PRINTED IN RESPONSE **
7017 REM * TO AN UNDEFINED MORSE *
7018 REM *** CODE CHARACTER *****
7019 REM *****
7020 REM *****

```



WD8BNG

O.K.... now you know!



I have just received a nifty gadget from "THE ALIEN GROUP". It is a voice synthesizer for the ATARI Computer System! I have often been skeptical about such units and their value to a computer system, but the attractive pricing of this unit broke down my defenses... It is only \$160 complete with software driver program. Hookup is as simple as plugging it into your daisy-chain as the last unit since it has no expansion port of its own. After selecting a couple of options from the menu, lo-and-behold, a plain, though distinctly computer-sounding voice says "Please teach me to speak"!! Gads! I was shocked!

I quickly grabbed the manual (several heavyweight stock sheets) and tried to figure out what I was supposed to do now. As it turns out, all you have to do is type a word or sentence in plain English and the ATARI will look through the "dictionary" for the words you have typed in and come back with a reasonable facsimile of the English equivalent in a mono-tone drone. Any words that aren't in the "dictionary" are treated as a group of PHONEMES and the ATARI will try to pronounce them in a close resemblance of English. It is impossible to describe some of the sounds that come out at times... sometimes the results are hysterically funny! One of the great features of the software is the ability of the dictionary's data base to be expanded. As an example:

If I type in WDBBNG and ENTER, the results are a garbled bunch of sounds of which only the "B" is recognizable. BUT, after experimenting with the actual SOUND of my call, I came up with the following equivalent: DUHBEYOU DEE B BEE EHN JEE-- which, when entered, sounds like the real thing! So, to expand the dictionary, all I had to do was type DUHBEYOU DEE B BEE EHN JEE=WDBBNG. From that point on, I got the correct pronunciation! After building this dictionary, which already has many common words, you can save it as a separate file such as "HAM". From then on I can access the "HAM" dictionary from the prompts at the initialization of the program.

I can see using this program and hardware as a basis for many interactive programs and educational aids. It can give you an audible prompt at certain points in the program that you are developing and be used to check for input errors during program execution. i.e., "SORRY JACK YOU GAVE ME AN INVALID RESPONSE" or, "HEY DUMMY KEEP YOUR !@#&* FINGERS ON THE RIGHT KEYS"!! These could be accessed with a TRAP statement within the main program. By keeping the dictionary down to the minimum required for your particular program's prompting needs, the memory usage would not be too extensive.

Another good use for this combination would be for use as a repeater or station IDer! By sending the audio signal into your equipment, you could do some pretty fancy things on the air! The speed of delivery is adjustable from VERY fast to ver S L O W, and the pitch of the voice can be changed as you type in the words or enter them into the library.

Of course, not everyone will want this little black box for their ATARI system, but I DO recommend that everyone check it out at your local dealer. Just for the heck of it! It's a lot of fun to use and the cost is less than half of the similar-sounding VOTRAX unit for the other computers on the market! (Of course, those other computers don't have the built-in full sound capability that the ATARIs have either!)

If any of the members are using this unit and have come up with any good applications, let me know. I'd be glad to let everyone know about your experiences. JMc WDBBNG

P.S. As an added attraction, the software provides for a talking-face on the screen as an option--- Pretty impressive, though a malevolent-looking personality. I suppose this would be a good way to demonstrate the unit for a short time, but after a while you want to poke the entity right in the Phosphors!

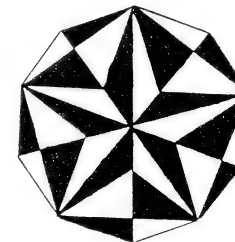
Jack, WDBBNG

TWO-UP MAILING LABELS, by John W. Tucker, WDBBHU

```

1 ?"?:??:??:??:?" 2-UP Label printing program"
2 POKE 755,0:?"?:?" by John W. Tucker, WDBBHU"
3 FOR W=1 TO 2000: NEXT W
10 DIM N$(100),A$(100),C$(100),B$(100),D$(100),G$(100),S$(1)
20 ?"?:?" "Do you want both address labels to be the same";
30 INPUT B$
40 IF B$(1,1)="Y" THEN 50
45 IF B$(1,1)="N" THEN GOSUB 1000
50 ? "How many pairs of labels do you want";
60 INPUT N
70 ?"?:?" "Enter name, full street address, city, state, & ZIP"
75 ??: INPUT N$
80 INPUT A$
90 INPUT C$
115 FOR A=1 TO N
120 LPRINT N$;:LPRINT N$:LPRINT A$;:LPRINT A$
125 LPRINT C$;:LPRINT C$:LPRINT LPRINT LPRINT
135 NEXT A
140 ?"?:?" "Do you want more labels";
150 INPUT S$
160 IF S$(1,1)="Y" THEN 20
170 IF S$(1,1)="N" THEN ?"?:"END
1000 ?"How many pairs of labels do you want"
1001 INPUT N
1005 ?"?:"
1009 ?"Enter first name, address, city, state, & ZIP"
1010 ??: INPUT N$:INPUT A$:INPUT C$
1020 ??:??:?"Enter second name, address, city, state & ZIP"
1030 ??:INPUT B$:INPUT D$:INPUT G$
1035 FOR A=1 TO N
1040 LPRINT N$;:LPRINT B$:LPRINT A$;:LPRINT D$:LPRINT C$;
1041 LPRINT G$:LPRINT:LPRINT:LPRINT
1045 NEXT A
1050 ?"?:?" "Do you want more labels"
1060 INPUT S$
1070 IF S$(1,1)="Y" THEN 20
1080 IF S$(1,1)="N" THEN ?"?:"END

```



NEWS FLASH!!! ATARI IS DROPPING THE CENTRONICS 739 LINE IN FAVOR OF THE OKIDATA PRINTER!!! THIS IS DIRECTLY FROM ATARI!!!

THE 74LS367 TRI-STATE HEX BUFFER BY NATIONAL SEMICONDUCTOR IS A RATHER STABLE, SIMPLE AND READILY AVAILABLE DEVICE. IT IS CURRENTLY OFFERED FROM MOST SUPPLIERS INCLUDING RADIO SHACK STORES.

IF YOU WILL LOOK AT DRAWING 1 YOU WILL SEE THAT THERE ARE SIX GATES IN THE CHIP. FOUR OF THE GATES ARE OPENED BY GROUNDING PIN 1 AND THREE OTHERS BY GROUNDING PIN 15. BY TYING PINS ONE AND 15 TOGETHER IT IS POSSIBLE TO OPEN ALL SIX GATES AT THE SAME TIME. THE SUPPLY VOLTAGE CAN BE ANY WHERE FROM +5 TO 7 VOLTS DC AND THE PULL-UP RESISTOR FROM 1 TO 2.2K OHMS.

BY REFERING TO DRAWING 2 YOU CAN SEE FROM THE BLOCK DIAGRAM THAT IT IS POSSIBLE TO USE THIS CHIP BY CHAINING TWO (OR MORE) TOGETHER TO GIVE A 12 GATE SWITCH THAT IS ON WHEN PINS 1&15 ARE GROUNDDED. BY USING THE CHIPS AS BUFFERS FOR OUT PUT FROM THE GAME PORTS ON THE ATARI AND THE 850 INTERFACE IT IS POSSIBLE TO BRING THE COMPATABLE DATA BITS FROM EACH BACK TO A COMMON PRINTER CONNECTOR. THEN, WITH THE FLIP OF A SWITCH YOU CAN SELECT BETWEEN EITHER HAMSOFT PRINTING OR REGULAR PRINTING..

I PURPOSESLLY DID NOT INCLUDE A COMPLETE SCHEMATIC DIAGRAM SINCE MANY DIFFERENT CONNECTORS AND CONFIGERATIONS ARE POSSIBLE WITH AN UNDERSTANDING OF THIS CIRCUIT. BY REFERENCING YOUR OWN LINES IT IS PRACTICLE TO USE A COMMON PRINTER FOR TWO COMPUTERS OR TO SWITCH BETWEEN TWO DIFFERENT PARALLEL PRINTERS ON THE SAME COMPUTER WITHOUT EVER UNPLUGING A CABLE.... JUST FLIP THE SWITCH!!!

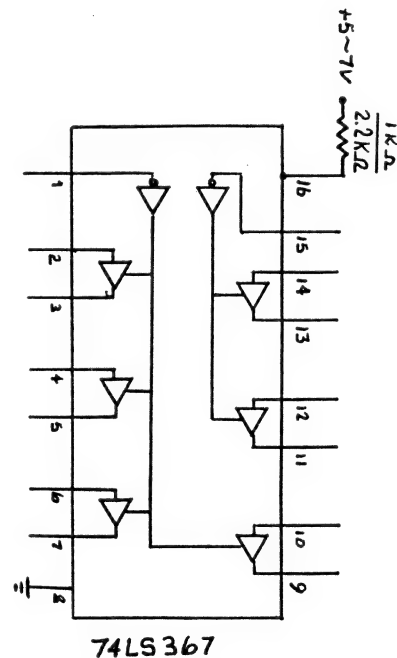
SOME CAUTIONS YOU MIGHT WISH TO OBSERVE IF YOU DO DESIGN YOUR OWN SWITCH ARE KEEPING THE LEAD TO THE ATARI OR 850 FROM THE SWITCH AS SHORT AS POSSIBLE SINCE YOU WILL LOOSE THE TWISTED GROUND PAIRS. DON'T WORRY ABOUT RUNNING THE TWISTED GROUNDS FOR THE PRINTER THROUGH A CHIP OR THE SIGNAL GROUNDS FROM THE CPU. JUST MAKE THEM COMMON TO ALL. THE POWER SUPPLY FOR THE SWITCH SHOULD BE 5 VOLTS BUT IT WILL WORK TO 7. IF YOU DECIDE TO USE POWER FROM OTHER THAN THE 10-12 VOLTS AVAILABLE FROM THE ATARI (WHICH YOU WILL HAVE TO CHOP WITH A ZD, ETC.) KEEP THE NEGATIVE LINE SEPARATE FROM THE DATA LINE GROUNDS.

THIS IS A RELATIVELY SIMPLE, INEXPENSIVE AND WORTH WHILE PROJECT THAT CAN BE AS COMPLEX OR SIMPLE AS YOU WANT. IT CAN BE CONFIGURED WITH WIRE WRAP OR LAID OUT ON A PC BOARD WITH A RESIST PEN AND ETCHED. JUST KEEP YOUR LEADS AS SHORT AS POSSIBLE TO AVOID PRINTER "BUCKSHOT".

DE WE4EZK
JULY 4, 1982

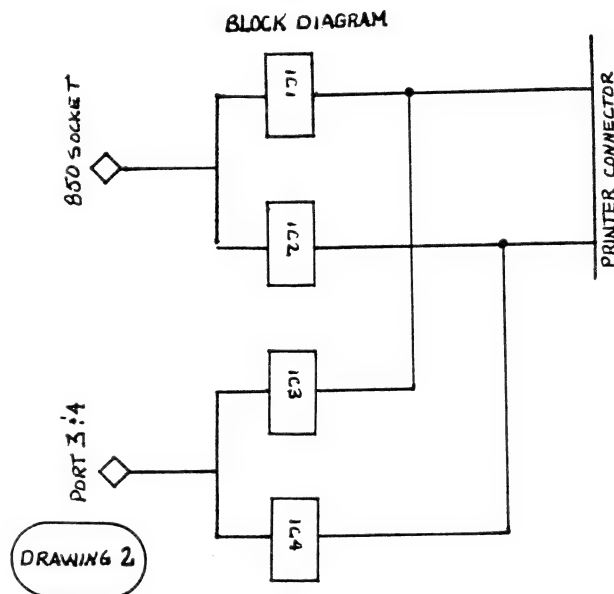
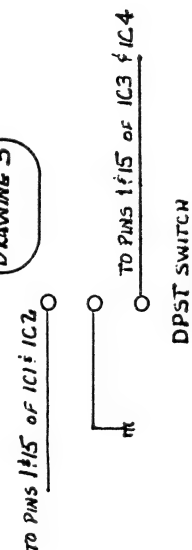
73'
Randy

DRAWING 1



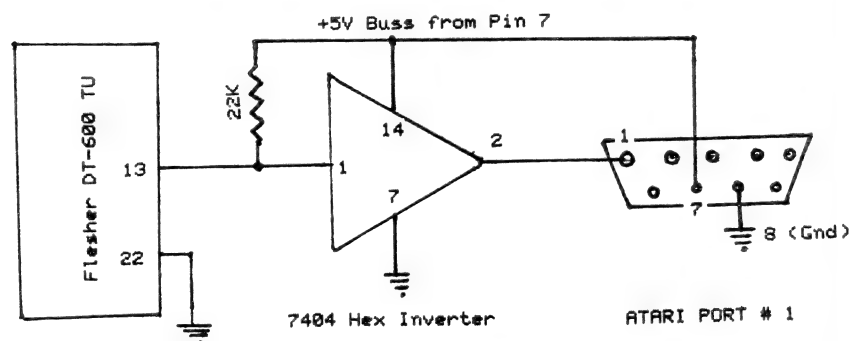
TRI-STATE HEX BUFFER

DRAWING 3



DRAWING 2

INTERFACE FOR USING DT-600 TU WITH ATARI 8. HAMSOFT by Paul Gilk & WD4BIT

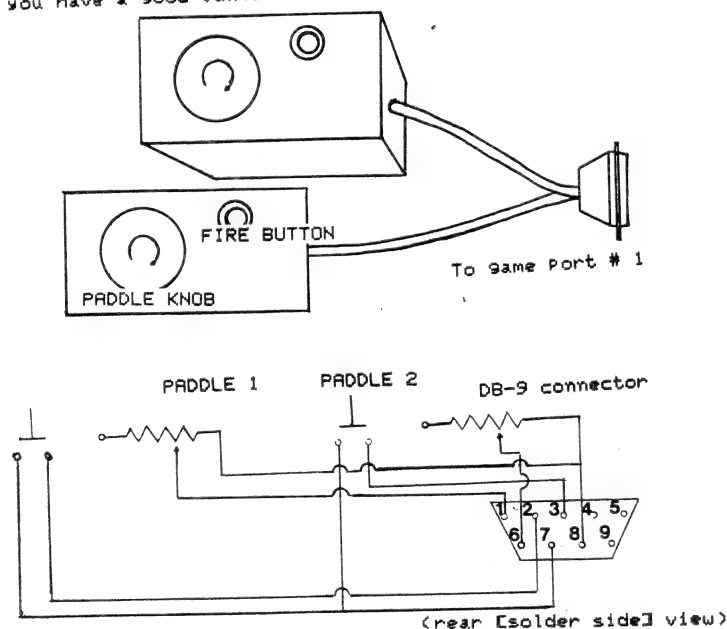


MAKE YOUR OWN GAME PADDLES by Randy T. Agnew, WB4BZX

MATERIALS:

- (2) 1 Meg potentiometers (RS# 271-211) \$1.09 ea.
- (1) DB-9 female connector (approx \$2.50 ea.)
- (1) DB-9 Hood (optional, also check for fit)
- (2) Plastic Mini-boxes (RS# 270-221) \$1.89 ea.
- (2) Mini SPST Momentary contact switch (RS# 275-1547) \$2.49 Per Pack of 5
- (2) Matching knobs, the larger the better (scrounged)
- (6 ft.) 4-conductor rotor cable (scrounged)

Total new material cost- \$11.00. Much less if you have a good junkie box!

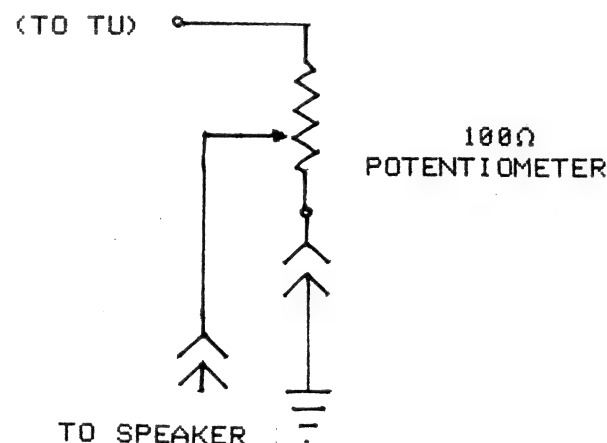


TOO LOUD! by Bill Janovsky, KG2L

I really love my Kantronics "The Interface"- I get consistantly good reports and I am printing some VERY WEAK DX signals with it! One thing I have found is that the unit requires a lot of audio drive, which makes for some uncomfortable listening levels at times.

If you like, you can lower the speaker volume, but NOT the level to the TU by using the circuit shown below. It works great for me! 73, Bill, KG2L

Editor's note: I have my own system, instead of using the interface between the receiver and speaker, I wired up a 1/4" phone plug and just insert it into the headphone jack far enough to make good contact. This gives good RTTY reception, lowers the audio from the speaker, and I can push the plug all the way in if I want to cut the audio out altogether. Jack, WD8BNG





Ray Conway
2012 No. 6th. St.
Burbank, Ca. 91504
213 843-2223

August 14, 1982

Jack McKirgan II, WDBENG
4749 S.R. 207 N.E.
Washington C.H., Ohio 43160

Jack:

Received issue #3 today, and could not resist typing a short note using the letter processor program from issue #2.

I think it is the best and easisest to use of all I have seen, for writing short letters!

Enclosed form:

Sincerely yours,

Ray Conway

From member Don Moon, N6FTR:

After trying manicuring scissors, regular scissors and a hole punch, I found that the best thing to use to cut a write-enable notch on a diskette in order to use the backside of the diskette is a GC nibbling tool. It's just the right width and by taking three bites, the correct depth is made!

Editor's note-- Don't do this regardless of the instrument you are using unless you are sure that it is NOT a magnetized instrument! This practice COULD BE FATAL to diskettes that have programs on them. It's best to make your notch when the disk is new or backed-up.

A LARGE SOFTWARE SOURCE!

from Rev. Gil Gilmore, KB4EY

There is a large assortment of software of an educational nature that is available from the Institute for Computers in Jewish Life, 845 N. Michigan Ave., Suite 843, Chicago, IL 60611. These programs cover a wide range of subjects from religious doctrine, geography, heritage, geology, language and scientific subjects. A catalog may be obtained by writing to the Institute. The programs are aimed at the 7th and 8th grade levels and most are interactive in nature.

INFORMATION FROM THE NET!!

John, WB6WIW, says that the no-hardware voice synthesizer as offered in the August 1982 issue of COMPUTE! Magazine works quite well. He was witness to a demonstration of this program at a local store and was VERY impressed with it's capabilities.

John, KC5FW and Pete, WB6OIP, confirm that if you have some machine language programs that bomb out on your machine and not on anothers', the problem, most likely is that your machine has the "B" revision ROM set. The problem is NOT with your ATARI hardware, rather with the programs, mainly those which have come from "Arcade Plus" software house. These programs are using illegal vectors in the ROM set and these were apparently ignored by the "A" series ROMs, but the "B" series sees them as a no-no! Since the Publication of "De Re ATARI" and other information on the operating system, this should no longer be a problem unless the software houses ignore the information that has been made available!

Several stations have remarked about the "FASTCHIP" floating-point ROM that has been made available from a number of sources. The fellows claim

that the "FASTCHIP" mods will increase execution time by 30 to 50% in programs that have many math computations. The difference is especially noticeable in programs that have a lot of trig functions that are invoked. The manufacturer is Newell Industries, 3340 Nottingham Ln., Plano, Texas 75074 (214) 423-1781

The "Leading Edge" software development system is a BIG hit! David and Sandy Small have come out with a super software development package that incorporates a unit that fits on top of the ATARI 800 and provides six expansion slots, optional EPROM burner and digital readout of track and sector in use and many other features. One of the best of these is the inclusion of a disk drive that reads/writes to the disks at 8 to 10 TIMES the rate of an ATARI 810 drive! Part of the package includes a new operating system, part of which provides a BIT COPY capability for diskettes! There won't be any problem making back-ups of your favorite programs with this system! The Price?? Hold on to your hats- a bit over \$1000!!! Certainly not for the average hacker, but if you are into software development you can't beat the capabilities that it has! The Price includes one of the super fast disk drives, so it really isn't that high!

I BUILT IT!

a review of the WD4HPL/W5UGQ Interface
as published in Issue # 3 of Ad Astra
by Dave Hartman, KD8Z

I constructed the interface on vector board using IC sockets. The only construction problems I encountered were some incomplete or inaccurate indications on the original schematic. ‡ (See note below, WD8BNG). All parts were easily obtained locally except for the EXAR 2211 and 2206 chips which I got from JDR Microdevices in California at 800-538-5000 Toll free.

I first put power to the interface over the Labor Day weekend, and I can say that I am VERY pleased with it. I am presently using it to send and receive 60 WPM RTTY on 20 meter and 2 meter FM, and at 110 baud ASCII on 2 meters FM. The interface works perfectly on ASCII, a definite plus that I wasn't counting on! The interface will copy signals perfectly with no S-meter reading at all. Be sure to use the Kantronics "HAMSOFT" software for which it was designed. Also be sure to set the NORMAL/REVERSE switch in the "NORMAL" position and toggle the "HAMSOFT" upon power-up to the (other) Terminal status. I have also copied 50 WPM CW solidly. In the CW mode, adjust the receiver until the LED blinks with the CW notes. On ASCII/RTTY, the LED should be off with the low note, on with the high tone.

I am still having a slight problem with the CW ID in the RTTY/ASCII mode, but I should have this solved before this goes to press.

73, Dave, KD8Z

‡ Editor's note: The corrected schematic for this unit is included in this issue of "Ad Astra...". The authors wish to express their concern over any inconvenience caused by the problems with the original schematic.

THE MONKEY WRENCH A PROGRAMERS AID FOR ATARI 800 COMPUTERS Product Evaluation By Randy T. Agee - WB4BZX

Eastern House Software, 3239 Linda Drive, Winston-Salem, NC offers a ROM card that fits into the "right" slot in the Atari 800 and functions as an extension to Atari Basic. The card retails for \$49.95 and comes with an adequate instruction manual. I have had the opportunity to use this little aid for just over four weeks now and feel comfortable enough with it to relate my opinions and evaluation to those of you who are considering purchase of the ROM.

CARD FUNCTIONS

- 1) AUTO LINE NUMBERING - by entering >A 10 10 (or any other number combination) your program is automatically numbered as you write it. You may exit this mode by pressing the break key.
- 2) DELETE RANGE OF LINE NUMBERS - >D (starting number) (ending number) will remove any part of the basic program.
- 3) SET MARGINS - >M (left) (right) sets the screen margins. Why this was included with the ease of poke 82 & 83 in Atari BASIC I don't understand!
- 4) EXCHANGE CURSOR KEYS - >E allows use of cursor movement without the CTRL key. You now have to use CTRL for * + = and -. This function may be turned off.
- 5) RENUMBER BASIC PROGRAM - >R (start) (increment) will renumber your basic program as well as GOTO, GOSUB, IF THEN, ON GOTO, ON GOSUB, RESTORE and TRAP statements within the program.

6 etc.) In addition the Monkey Wrench offers

commands to convert decimal and hex numbers to their counter parts as well as a very extensive memory tester that will weed out any bugs in the system. There is a neat little, but powerful, machine language monitor with 15 additional commands for those who speak 6502 codes and can decipher the results. Some of those available include: display memory, interrogate memory, display registers, alter registers, Hex-ASCII character/string hunts, disassemble memory and alter disassemble listings.

ADVANTAGES

The card may be removed when running a program to regain any lost memory in maximum RAM systems, program building is certainly much easier with MW than with just BASIC. The built in machine language monitor is nice since you do not have to power down and load in the Assembler for most machine work and coding. Unlike a diskette, ROM's are not subject to oblivion when your cat knocks over that favorite beverage where they reside. Most notable, of course, is the lack of long boot times.

DISADVANTAGES

Those who might be using a serial printer on the 850 interface ports will not be able to do listings unless you first save your program to disk or cassette, pull the Monkey Wrench Card, and reenter your program, the ROM is not compatible with the 850 serial ports. If you are using a parallel printer there is no problem. The card is provided without a case and requires looking into the computer to install. Also, the sharp prongs on the back of the card will bring blood from the unsuspecting user! On a system over 32K an additional 8K of RAM will be overlaid.

EVALUATION

Overall, I was impressed with the the ROM and it's functions. It did everything the people at Eastern House said it would with the exception of operating without BASIC as an independent MLM, this arrangement failed to give more than a blank CRT screen. I feel like I can recommend it's purchase to anyone who does alot of his own programing, uses a parallel printer and a cassette based system. I observed several bugs while using DOS, some causing system lockup and others creating some very strange occurrences. Oddly enough, these bugs did not appear without DOS. For those with a disk drive I feel your best investment would be either Atari Microsoft or OSS Basic A+. They are only about \$25.00 more than the Monkey Wrench ROM and not only offer similar programing extensions (other than the MLM) but are considerably more powerful. On the other hand, if you are committed to Atari BASIC or wish to edit or alter existing programs it is certainly a pleasure to use the MW and it's extensions are super fast. The one thing that aggravated me the most about the ROM was that the screen blatantly displays four additional lines of program title and copyright information everytime you reset or boot up. I found myself reaching for the clear key immediately. I would certainly think this information could be reduced to one line and still get the advertising across! If I may grade Monkey Wrench on a scale of 1 to 10 I will give it a solid 7. It is a worthwhile investment for those interested in such a utility.

73's

Randy

WB4BZX

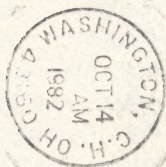
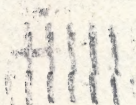
NOTE!! CHECK YOUR RENEWAL CODE- IF
THERE IS NO CODE, THEN THIS IS
YOUR LAST ISSUE!!!!!!!!!!!!!!

THE ATARI MICROCOMPUTER NETWORK

JACK MCKIRGAN II WD8BNG

4749 S.R. 207 N.E.

Washington C. H., Ohio 43160



Robert Millikan



THIS IS YOUR LAST ISSUE UNLESS
RENEWAL IS RECEIVED!

First Class